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Claims

[c1] A pre-crash sensing and countermeasure deployment control system for an automotive vehicle coupled to a countermeasure system having an external airbag system, said pre-crash sensing system and countermeasure deployment comprising:
an object classifier generating an object classification signal; and
a controller coupled to said object classifier for varying an activation level of the external airbag in response to said object classification signal.

[c2] A system as recited in claim 1 wherein the object sensor comprises a radar or lidar unit generating an object distance signal and object relative velocity signal and a vision system generating an object classification signal, said controller generating an external airbag activation control signal in response to an object distance signal, an object relative velocity signal and an object classification signal.

[c3] A system as recited in claim 2 wherein said object classification comprises classifying collision objects into pedestrian and non-pedestrian objects.

[c4] A system as recited in claim 2 wherein said object classification comprises object sizes including object area and object height.

[c5] A system as recited in claim 2 further comprising a vehicle speed sensor generating a longitudinal speed signal corresponding to the longitudinal speed of the vehicle; wherein said controller activates said external airbag in response to the longitudinal speed signal.

[c6] A system as recited in claim 2 further comprising a decision zone; wherein said radar or lidar sensor generates an object distance and relative velocity signals from an object within said decision zone and said vision sensor confirms the presence of the object within the said decision zone.

[c7] A system as recited in claim 1 wherein varying the activation level comprises varying the level from a high rate to a low rate.

[c8] A system as recited in claim 1 wherein the low rate corresponds to an object classification of a pedestrian.

[c9] A system as recited in claim 1 wherein the high rate corresponds to an object classification of a second vehicle.

[c10] A system as recited in claim 1 wherein the external

airbag system comprises a bumper bag.

[c11] A system as recited in claim 1 wherein the external airbag system comprises a grill bag.

[c12] A system as recited in claim 1 wherein the external airbag system comprises a bumper bag and a grill bag.

[c13] A method for operating a pre-crash sensing and countermeasure deployment control system for an automotive vehicle having an external airbag system, said method comprising:
establishing a decision zone relative to the vehicle;
detecting an object within the decision zone;
classifying the object into an object classification;
determining an external airbag activation rate corresponding to the object classification; and
activating the external airbag system at the activation rate.

[c14] A method as recited in claim 13 wherein determining comprises choosing between a low activation rate and a high activation rate.

[c15] A method as recited in claim 13 wherein the low activation rate corresponds to a pedestrian classification.

[c16] A method as recited in claim 13 wherein the high activa-

tion rate corresponds to a vehicle classification.

[c17] A method as recited in claim 13 wherein activating the external airbag system at the activation rate comprises activating a grill airbag.

[c18] A method as recited in claim 13 wherein activating the external airbag system at the activation rate comprises activating a bumper airbag.

[c19] A method for operating a pre-crash sensing and countermeasure deployment control system for an automotive vehicle having an external airbag system, said method comprising:
detecting an object;
classifying the object;
when the object is a pedestrian, activating an external airbag of the external airbag system at a first rate;
when the object is a second vehicle, activating the external airbag system at a second rate greater than the first rate.

[c20] A method as recited in claim 19 wherein the second rate corresponds to object size.